AR
TPW

PATENT
Attorney Docket No.: SP01-253

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Boek, Heather D,. et al.	
Serial No:	10/035,535	Examiner: Hoffman, John M
Filing Date:	10/26/2001	Group Art Unit: 1731
Title:	Methods and Apparatus for Forming a Chlorine Doped Optical Waveguide Preform	

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

This Brief supports the appeal to the Board of Patent Appeals and Interferences from the final rejection dated April 01, 2005, in the application listed above. Appellant filed the Notice of Appeal on April 22, 2005. Appellant now submits this Brief as required by 37 C.F.R. § 1.192(a) and in response to the Notification of Non-Compliant Appeal Brief filed on September 2, 2005.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Corning Incorporated.

II. RELATED APPEALS AND INTERFERENCES

With respect to prior or pending appeals, interferences or judicial proceedings, there are no such appeals, interferences or judicial proceedings known to Appellant, Appellant's legal representative or Appellant's assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1 – 3, 6 – 31 and 36 – 37 were finally rejected in an Office Action dated April 1, 2005. Those are the pending claims that are the subject of this Appeal and are set forth in the attached Appendix. Claims 4, 5, 32 – 35 have been canceled as a result of a previous amendment.

IV. STATUS OF AMENDMENTS

There are no amendments filed subsequent to final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 relates to a method of manufacturing an optical waveguide preform. In particular, an optical waveguide soot preform (FIG. 2, reference character 5) is exposed to an atmosphere (FIG. 2, reference character 150) comprising a chlorine-containing gas, wherein the optical waveguide preform (5) is doped with chlorine (page 5, lines 25-31). The atmosphere (150) is at an absolute pressure substantially greater than 1.013×10^2 kPa (page 2, lines 8-9; page 6, line 27).

Claim 19 relates to a method of manufacturing an optical fiber preform. A soot preform (FIG. 2, reference character 5) is exposed to an atmosphere (FIG. 2, reference character 150) including a chlorine-containing gas for a period of at least 60 minutes (page 2, lines 11-13; page 7, line 16), thereby doping the preform (5) with chlorine. The absolute pressure of the atmosphere (150) is substantially greater than 1.013×10^2 kPa (page 2, lines 8-9; page 6, line 27), the mole percentage of chlorine present in the atmosphere (150) is greater than about 20% (page 7, lines 13-14), the weight percentage of chlorine present in the soot preform (5) is greater than about 1% (page 7, lines 20-21), and the temperature of the atmosphere (150) is at least 1000°C (page 7, line 9). The chlorine-containing gas is selected from the group consisting of $GeCl_4$, $SiCl_4$, Cl_2, CCl_4, $SOCl_2$ and $POCl_3$ and combinations

thereof (page 7, lines 23-24).

Claim 36 relates to a method of manufacturing an optical waveguide preform. A soot preform (FIG. 2, reference character 5) is exposed to an atmosphere (FIG. 2, reference character 150) including a chlorine-containing gas, thereby doping the soot preform (5) with chlorine. The absolute pressure of the atmosphere (150) is substantially greater than $2.026x10^2$ kPa (page 7, line 1) and the mole percentage of chlorine present in the atmosphere is between about 20% and 40% (page 7, lines 14-15).

Claim 37 relates to a method of manufacturing an optical waveguide preform. A soot preform (FIG. 2, reference character 5) is exposed to an atmosphere (FIG. 2, reference character 150) including a chlorine-containing gas, thereby doping the soot preform (5) with chlorine. The absolute pressure of the atmosphere (150) is substantially greater than $4.052x10^2$ kPa (page 7, lines 2-3) and the mole percentage of chlorine present in the atmosphere is between about 20% and 40% (page 7, lines 14-15).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 – 3, 6 – 31 and 36 – 37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ishikawa (U.S. Patent No. 6,116,055) and further in view of Kingery's "Introduction to Ceramics", pages 219-226.

VII. ARGUMENT

The rejection of claims 1 – 3, 6 – 31, 36 – 37 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,116,055 (Ishikawa) and in view of Kingery is improper.

Applicants respectfully traverse the Examiner's rejection of claims 1 – 3, 6 – 31, 36 – 37 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,116,055 (Ishikawa) in view of Kingery. Applicants assert that all pending claims stand or fall together.

A proper *prima facie* showing of obviousness requires the Examiner to satisfy three requirements. First, the prior art relied upon, coupled with knowledge generally available to

one of ordinary skill in the art, must contain some suggestion which would have motivated the skilled artisan to combine references. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, the Examiner must show that, at the time the invention was made, the proposed modification had a reasonable expectation of success. See Amgen v. Chugai Pharm. Col, 927 F.2d 1200, 1209, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991). Finally, the combination of references must teach or suggest each and every limitation of the claimed invention. See In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

With regard to claim 1, the Examiner points out that Ishikawa acknowledges the possibility of using a pressure greater than one atmosphere (see Ishikawa, column 1, lines 60-65) and that Kingery supports the proposition that the higher the pressure of the gas, the higher the concentration of the solute. The Examiner concludes that it would therefore have been obvious to use as high a pressure as reasonably possible in the Ishikawa method so as to maximize the amount of chlorine in the preform.

Appellants disagree and submit that Ishikawa and Kingery at best provide incentive to try. "An 'obvious-to-try' situation exists when a general disclosure may pique the scientist's curiosity, such that further investigation might be done as a result of the disclosure, the disclosure itself does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued.", In re Eli Lilly & Co., 14 USPQ2d 1741, 1743 (CAFC 1990).

Appellants assert that Ishikawa teaches nothing beyond the fact that use of a partial pressure greater than one atmosphere presents a problem. While Kingery may broadly suggest that increasing pressure can increase diffusion of a gas across a boundary or into a body, Kingery does not disclose or suggest exposing an optical fiber preform to chlorine at a pressure substantially greater than 1.013×10^2 kPa. Appellants contend that Ishikawa and Kingery, combined, at best merely suggest that it might be obvious to try chlorine doping at high pressure.

As the Federal Circuit has noted, "A general incentive does not make a particular result, nor does the existence of techniques by which those efforts can be carried out", In re Duel, 34 USPQ2d 1210, 1216 (CAFC 1995). Ishikawa makes no claim that doping at high pressure (e.g. substantially greater than one atmosphere) would be effective. Certainly the most obvious observation is that Ishikawa would undoubtedly have been aware of the thermodynamic relationships presented by Kingery, and yet armed with the knowledge of his

own invention, the path Ishikawa chose was not one which included a total pressure substantially greater than one atmosphere, suggesting that the relationships described by Kingery were not sufficient motivation for Ishikawa to explore high pressure doping.

Even assuming, *arguendo*, that Ishikawa's reference to partial pressure greater than one atmosphere suggests a direction to explore, Ishikawa does not teach how one would do this, and neither does Kingery.

"In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method", Beckman Instruments Inc. v. LKB Produkter AB, 13 USPQ2d 1301, 1304 (CAFC 1989).

Ishikawa suggests a pressure in excess of one atmosphere presents a problem. However, Ishikawa provides no prescription for how one would go about overcoming that problem. That Ishikawa chose not to pursue high pressure doping due to an inherent problem, and discloses no other teaching other than to point out that problem, provides a *per se* argument that Ishikawa's disclosure is non-enabling, particularly as it relates to chlorine doping at a pressure substantially greater than one atmosphere. Again, Kingery does not cure this deficiency.

The Examiner asserts that it would be obvious to use as high a pressure as possible given the teachings of Ishikawa et al. and Kingery. However, a showing of a suggestion to combine must be clear and particular, and hindsight must be rigorously avoided. Ecolochem Inc. v. Southern California Edison, 56 USPQ2d 1065 (CAFC 2000). The Examiner begins with Appellants' disclosure as a blueprint, and then seeks references which, when combined, may yield Appellants' invention. As discussed *supra*, Ishikawa specifically discourages extending the partial pressure (let alone the total system pressure) above one atmosphere. Kingery, on the other hand, merely presents known principles of nature. With regard to Kingery, "..all inventions can be reduced to underlying principles of nature which, once known, make their implementation obvious...", Diamond, Commissioner of Patents and Trademarks v. Diehr and Lutton (450 U.S. 175, 209 USPQ 1 (SC 1981), footnote 12.) At best, the Examiner's position amounts to an obvious-to-try argument, as considered above.

For at least the reasons given above, Appellants assert that the Examiner has failed to make a *prima facie* case of obviousness, and that the Board should reverse the §103 rejection and find that claims 1 – 3, 6 – 31, 36 – 37 are allowable over the prior art of record.

Conclusion

In conclusion, Appellants request a reversal of each of the grounds of rejection maintained by the Examiner and prompt allowance of the pending claims Claims 1 – 3, 6 – 31, 36 – 37.

Please charge the fees due under 37 C.F.R. § 1.17(c) to Deposit Account No. 03-3325. If there are any other fees due in connection with the filing of this Brief on Appeal, please charge the fees to our Deposit Account No. 03-3325. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

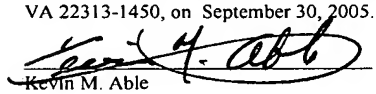
Respectfully submitted,

Dated: September 30, 2005

By: 

Kevin M. Able
Registration No. 52,401
607-974-2637
Corning Incorporated
Patent Department
SP-TI-03-01
Corning, NY 14831

CERTIFICATE OF MAILING (37 CFR 1.8a)
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope Addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on September 30, 2005.



Kevin M. Able

VIII. CLAIMS APPENDIX

The claims on appeal are as follows:

1. **(Rejected)** A method of manufacturing an optical waveguide preform, said method comprising:

exposing a soot preform to an atmosphere including a chlorine-containing gas and thereby doping the soot preform with chlorine, wherein the absolute pressure of the atmosphere is substantially greater than 1.013×10^2 kPa and the mole percentage of chlorine present in the atmosphere is between about 20% and 40%.

2. **(Rejected)** The method of Claim 1 including, prior to said step of exposing the soot preform, inserting the soot preform into a consolidation furnace.

3. **(Rejected)** The method of Claim 1 including:

drying the soot preform prior to said step of exposing the soot preform; and

sintering the soot preform following said step of exposing the soot preform.

4. **(Canceled)**

5. **(Canceled)**

6. **(Rejected)** The method of Claim 1 wherein the weight percentage of chlorine present in the soot preform is greater than about 1%.

7. **(Rejected)** The method of Claim 1 wherein the weight percentage of chlorine present in the soot preform is between about 1.0% and 1.5 %.

8. **(Rejected)** The method of Claim 1 wherein the chlorine-containing gas is selected from the group consisting of $GeCl_4$, $SiCl_4$, Cl_2, CCl_4, $SOCl_2$, $POCl_3$ and combinations thereof.

9. **(Rejected)** The method of Claim 1 wherein the atmosphere is at a temperature of at least about 1000 °C.

10. **(Rejected)** The method of Claim 1 wherein the atmosphere is at a temperature of between about 1250 and 1350 °C.

11. **(Rejected)** The method of Claim 1 wherein the absolute pressure of the atmosphere is greater than about 2.026×10^2 kPa.

12. **(Rejected)** The method of Claim 1 wherein the absolute pressure of the atmosphere is between about 4.052×10^2 and 16.32×10^2 kPa.

13. **(Rejected)** The method of Claim 1 including exposing the soot preform to the atmosphere for a period of at least 60 minutes.

14. **(Rejected)** The method of Claim 1 including exposing the soot preform to the atmosphere for a period of between about 60 and 180 minutes.

15. **(Rejected)** The method of Claim 1 wherein the soot preform includes silica and an element selected from the group consisting of germanium, fluorine, boron, phosphorous, erbium, antimony, aluminum, and titanium.

16. **(Rejected)** The method of Claim 1 including forming the optical waveguide preform such that the optical waveguide preform includes an inner layer formed from the chlorine doped soot preform and an outer layer surrounding the inner layer, wherein:

the inner layer and the outer layer are formed of materials having different viscosities at drawing temperatures in the range of between about 1600 and 2150 °C; and

the chlorine doping improves viscosity matching between the inner layer and the outer layer at said drawing temperatures as compared to a viscosity match between a corresponding inner layer and a corresponding outer layer of a like perform wherein the corresponding inner layer is not chlorine doped.

17. **(Rejected)** The method of Claim 16 wherein the inner layer includes silica and an element selected from the group consisting of germanium, fluorine, boron, phosphorous, erbium, antimony, aluminum and titanium.

18. **(Rejected)** The method of Claim 17 wherein the outer layer includes silica and an element selected from the group consisting of boron, phosphorous and fluorine.

19. **(Rejected)** A method of manufacturing an optical waveguide preform, said method comprising:

exposing a soot preform to an atmosphere including a chlorine-containing gas for a period of at least 60 minutes and thereby doping the soot preform with chlorine, wherein:

the absolute pressure of the atmosphere is substantially greater than 1.013×10^2 kPa;

the mole percentage of chlorine present in the atmosphere is greater than about 20%;

the weight percentage of chlorine present in the soot preform is greater than about 1%;

the chlorine-containing gas is selected from the group consisting of $GeCl_4$, $SiCl_4$, Cl_2, CCl_4, $SOCl_2$, $POCl_3$ and combinations thereof; and

the atmosphere is at a temperature of at least about 1000 °C.

20. **(Rejected)** The method of Claim 19 including, prior to said step of exposing the soot preform, inserting the soot preform into a consolidation furnace.

21. **(Rejected)** The method of Claim 19 including:

drying the soot preform prior to said step of exposing the soot preform; and

sintering the soot preform following said step of exposing the soot preform.

22. **(Rejected)** The method of Claim 19 wherein the mole percentage of chlorine present in the atmosphere is between about 20% and 40%.

23. **(Rejected)** The method of Claim 19 wherein the weight percentage of chlorine present in the soot preform is between about 1.0% and 1.5 %.

24. **(Rejected)** The method of Claim 19 wherein the atmosphere is at a temperature of

between about 1250°C and 1350 °C.

25. **(Rejected)** The method of Claim 19 wherein the absolute pressure of the atmosphere is greater than about 2.6×10^2 kPa.

26. **(Rejected)** The method of Claim 19 wherein the absolute pressure of the atmosphere is between about 4.052×10^2 and 16.32×10^2 kPa.

27. **(Rejected)** The method of Claim 19 including exposing the soot preform to the atmosphere for a period of between about 60 and 180 minutes.

28. **(Rejected)** The method of Claim 19 wherein the soot preform includes silica and an element selected from the group consisting of germanium, fluorine, boron, phosphorous, erbium, antimony, aluminum, and titanium.

29. **(Rejected)** The method of Claim 19 including forming the optical waveguide preform such that the optical waveguide preform includes an inner layer formed from the chlorine doped soot preform and an outer layer surrounding the inner layer, wherein:

the inner layer and the outer layer are formed of materials having different viscosities at drawing temperatures in the range of between about 1600 and 2150 °C; and

the chlorine doping improves viscosity matching between the inner layer and the outer layer at said drawing temperatures as compared to a viscosity match between a corresponding inner layer and a corresponding outer layer of a like perform wherein the corresponding inner layer is not chlorine doped.

30. **(Rejected)** The method of Claim 29 wherein the inner layer includes silica and a material selected from the group consisting of germanium, fluorine, boron, phosphorous, erbium, antimony, aluminum, and titanium.

31. **(Rejected)** The method of Claim 30 wherein the outer layer includes silica and an element selected from the group consisting of boron, phosphorous and fluorine.

32. **(Canceled)**

33. **(Canceled)**

34. **(Canceled)**

35. **(Canceled)**

36. **(Rejected)** A method of manufacturing an optical waveguide preform, said method comprising:

exposing a soot preform to an atmosphere including a chlorine-containing gas and thereby doping the soot preform with chlorine, wherein the absolute pressure of the atmosphere is substantially greater than 2.026×10^2 kPa and the mole percentage of chlorine present in the atmosphere is between about 20% and 40%.

37. (**Rejected**) A method of manufacturing an optical waveguide preform, said method comprising:

exposing a soot preform to an atmosphere including a chlorine-containing gas and thereby doping the soot preform with chlorine, wherein the absolute pressure of the atmosphere is substantially greater than 4.052×10^2 kPa and the mole percentage of chlorine present in the atmosphere is between about 20% and 40%.

IX. EVIDENCE APPENDIX

None

X. RELATED PROCEEDINGS APPENDIX

None